mathematics by children. Nov., 517–21.
FORBES, JACK E. Programmed instructional materials—past, present, and future. Apr., 224–27.
GAGNÉ, ROBERT M. Learning and proficiency in mathematics. Dec., 620–26.
GATES, JAMES D. Membership report. Nov., 557–58.
GILMORE, HAL M. Review of *Fundamental Concepts of Elementary Mathematics*, Brumfiel, Eicholz, and Shanks; Addison-Wesley, 1962. Jan., 39.
HALLERBERG, ARTHUR E. Review of *Mathematics, a Cultural Approach*, Kline; Addison-Wesley, 1962. Apr., 261–62.
HARVEY, REX E. Review of *Mathematics Enrichment—Program A*, Spooner; Harcourt, Brace, and World, 1962. Apr., 262–63.
HEGSTROM, WILLIAM J. A two-year study of eighth-grade Algebra I. Oct., 419–23.
HEIMER, RALPH T. Techniques of solving rational equations. Nov., 486–89.
HEINKE, CLARENCE H. Review of *Mathematical Discovery, On Understanding Learning, and Teaching Problem Solving*, Volume I, Polya; Wiley, 1962. Mar., 167.
HENDERSON, GEORGE L. An independent classroom experiment using teaching machine materials. Apr., 248–51.
HENDERSON, KENNETH B. *Editor.* Reviews and evaluations. Jan., 39; Feb., 103–04; Mar., 165–70; Apr., 261–67; May, 350–62; Oct., 433–36; Nov., 546–50; Dec., 639–42.
HENKELMAN, JAMES. Implementing a new mathematics curriculum. Apr., 211–17.
HILL, JANE M. Review of *Worktext in Modern Mathematics*, Marston; Row, Peterson, 1962. Oct., 436.
HILL, R. G. A triangle construction. May, 323–24.
HIRSCHI, L. EDWIN. Encouraging creativity in the mathematics classroom. Feb., 79–83.
HOCHSTEIN, A. E. Trisection of an angle by optical means. Nov., 522–24.
HOHN, FRANZ E. Review of *Tomorrow's Math, Unsolved Problems for the Amateur*, Ogilvy; Oxford University Press, 1962. Apr., 267.
HOLTAN, BOYD D. Review of *A Program in Contemporary Algebra, Book 1, Sets, Numbers, and the Language of Algebra*, Heimer, Kocher, and Lottes; Holt, Rinehart and Winston, 1963. Nov., 548–49.
HOLZINGER, JOSEPH. The problem of the angle bisectors. May, 321–22.
JERISON, MEYER. Natural bases of logarithms. Apr., 228–33.
JOHNSON, ARNOLD O. Concepts of mathematics —a unique program of high school mathematics for the gifted student. Jan., 26–30.
JOHNSON, ROBERT. Reviews of films. Dec., 578–605.
———. Review of film *Modern Elementary Algebra* (set of five filmstrips), Swain; Society for Visual Education. Mar., 169–70.
KARNES, HOUSTON T. Minutes of the Annual Business Meeting. Oct., 449–52.
———. The 1963–64 budget. Oct., 452–55.
KEMENY, JOHN G. Report to the international congress of mathematicians. Feb., 66–78.
KENNEDY, E. S. Al-Bīrūnī on determining the meridian. Dec., 635–37.
KEOUGH, JOHN J. Interest in the tetrahedron. Oct., 446–48.
KINGSTON, J. MAURICE. A variation on binary notation. Nov., 511–13.
KIRK, HOUSTON. Review of *Modern Albegra, First Course*, Johnson, Lendsey, and Slesnick; Addison-Wesley, 1961. May, 358–59.
KLINGLER, DONN L. Review of *Geometry, A Unified Course*, Goodwin, Vannatta, with Fawcett; Charles E. Merrill, 1961. May, 355–56.
KLUTTZ, MARGUERITE. The mathematics laboratory—a meaningful approach to mathematics instruction. Mar., 141–45.
KOCHER, FRANK T. Techniques of solving rational equations. Nov., 486–89.
KOENEN, WILLIAM B. Review of *Modern Geometry: Structure and Method*, Jurgensen, Donnelly, and Dolciani; Houghton Mifflin, 1963. Dec., 639–40.
KOVACH, LADIS D. Unilateral mathematics teaching. Nov., 550–52.
LANE, BENNIE R. Review of *Modern College Algebra*, Vance; Addison-Wesley, 1962. Mar., 167–68.
LANGE, L. H. Some inequality problems. Nov., 490–94.
LANTZ, WILLIAM B. Review of *Systematic Slide Rule Guide*, Allan; Pitman, 1962. Dec., 642.
LAYCOCK, MARY. Review of *Exploring Modern Mathematics*, Book I, Keedy, Jameson, and Johnson; Holt, Rinehart and Winston, 1963. Nov., 546–47.
LEVI, HOWARD. Why arithmetic works. Jan., 2–7.
LOWRY, WILLIAM C. *Editor.* Tips for beginners. Jan., 40–42; Feb., 105–08; Mar., 171–74; Oct., 437–48; Nov., 550–56; Dec., 643–46.
MEHL, WILLIAM G. Fractions and line segments. Dec., 610–13.
———. What do they really say? Mar., 171–74.
MILLER, JANICE. A generalization of triangular numbers. Oct., 414–18.
MOCK, GORDON D. The Perry Movement. Mar., 130–33.
MOORE, ALAN S. Some thoughts on quotient and remainder patterns. Nov., 514–16.
MORTON, R. L. Decimal and duodecimal reciprocals. May, 333–39.
MOSTELLER, FREDERICK. Continental Classroom's TV course in probability and statistics. Oct., 407–13.
NASH, BOBBY O. Review of *A Program in Contemporary Algebra, Book 2, Equations and Inequalities in One Variable*, Heimer, Kocher, and Lottes; Holt, Rinehart and Winston, 1963. Nov., 549.
NEWMAN, CLAIRE M. Challenging the talented mathematics student. Nov., 525–27.
NICHOLS, EUGENE D. *Editor.* Experimental programs. Jan., 26–30; Feb., 94–97; Mar., 155–59; Apr., 248–51; May, 340–43; Oct., 419–

23; Nov., 535–37; Dec., 627–31.
OSBORN, JESSE. The closing years of Greek mathematics. Nov., 540–45.
PAGE, ROBERT L. Pattern multiplication. May, 316–18.
PAYNE, JOSEPH N. *Editor.* Tips for beginners. Jan., 40–42; Feb., 105–08; Mar., 171–74; Oct., 437–48; Nov., 550–56; Dec., 643–46.
PEAK, PHILIP. *Editor.* Have you read? Jan., 7; Feb., 83, 90, 97, 110; Mar., 145, 159; Apr., 260; May, 332; Oct., 448, 460; Nov., 489, 494, 510; Dec., 613, 626, 646.
PECK, LYMAN C. Review of *Mathematics for Secondary School Teachers,* Meserve and Sobel; Prentice-Hall, 1962. Apr., 263.
PETERSEN, ARNOLD. Review of *Modern Mathematics for Junior High School, Book 1,* Rosskopf, Morton, Hooten, and Sitomer; Silver Burdett, 1961. Apr., 265–66.
———. Review of *Modern Mathematics for Junior High School, Book 2,* Rosskopf, Morton, Hooten, and Sitomer; Silver Burdett, 1961. Apr., 265–66.
PIERSON, ELLIOT. Junior high mathematics and the computer. May, 298–301.
PORGES, ARTHUR. The linear equation and absolute values. Apr., 222–23.
RAAB, JOSEPH A. Reviews of films. Dec., 578–605.
READ, CECIL B. The beginning of work in the theory of probability. Dec., 637–38.
———. Can present-day students work problems of seven or eight generations ago? Nov., 538–40.
REITZ, ROBERT G. Review of *Elements of Algebra,* Banks and Wren; Allyn and Bacon, 1962. May, 354–55.
RIFFLE, DONALD E. A two-year study of eighth-grade Algebra I. Oct., 419–23.
RINGENBERG, LAWRENCE A. The area of a rectangle. May, 329–32.
ROBINSON, EDITH. Strategies of proof. Nov. 531–34.
ROBINSON, GEORGE A. Review of *Modern Mathematics, A Programmed Textbook,* Eigen, Kaplan, Emerson, and Krouse; Science Research Associates, 1962. May, 361.
ROGLER, PAUL V. The Mathematics League—for motivation and inspiration in mathematics. Apr., 223, 267, 274.
ROLLINS, WILMA E. Concepts of mathematics—a unique program of high school mathematics for the gifted student. Jan., 26–30.
RUDD, LONIE E. Review of *Modern Mathematics in the Elementary and Junior High Schools,* Williams, Read, and Williams; Singer, 1961. Mar., 168–69.
SACHS, LEROY. Review of *Algebra One, A Modern Course,* Vannatta, Goodwin, with Fawcett; Charles E. Merrill, 1962. May, 351–52.
———. Review of *Algebra Two, A Modern Course,* Vannatta, Goodwin, with Fawcett; Charles E. Merrill, 1962. May, 351–52.
ST. JOAN OF ARC, SISTER MARY. Review of *Foundations of Mathematics,* Wiebe; Holt, Rinehart, and Winston, 1962. Apr., 261.
———. Review of *New Ways in Numbers—7, An Arithmetic Series for Catholic Schools,* Sister Mary Canisius; Heath, 1962. Nov., 547–48.
SALZARULO, LEONARD M. Using vectors to solve simultaneous equations. May, 314–15.
SANTNER, JOSEPH F. A note on curve fitting. Apr., 218–21.
———. A second note on curve fitting. May, 307–10.
SCHIPPER, JOAN. A report of an experiment at Camelback High School. Mar., 155–59.
SCHMIDT, ROLAND L. Using the library in junior high school mathematics classes. Jan., 40–42.
SCHOLOMITI, N. C. A triangle construction. May, 323–24.
SCHOR, HARRY. Altitudes, medians, angle bisectors, and perpendicular bisectors of the sides of triangles. Feb., 105–06.
———. An introduction to the angle measurement theorems in plane geometry. Feb., 107–08.
SCHULZ, CHARLES E. Review of *Arithmetic: Concepts and Skills,* Brumfiel, Eicholz, Shanks, and O'Daffer; Addison-Wesley, 1963. Oct., 433–34.
SCHUMAKER, JOHN A. Review of *Algebra and Trigonometry,* Miller and Green; Prentice-Hall, 1962. May, 350–51.
SEYMOUR, KENNETH A. A general test for divisibility. Mar., 151–54.
SHREVE, WARREN E. Teaching inductive proofs indirectly. Dec., 643–44.
SHUFF, ROBERT V. Comparative study of SMSG and traditional mathematics text material. Nov., 495–504.
SIMPSON, RAY H. Mathematics teachers and self-evaluation procedures. Apr., 238–44.
SMITH, ROLAND F. *Review of Basic College Algebra,* Mancill and Gonzalez; Allyn and Bacon, 1962. Oct., 434–35.
SOYCHAK, ANTHONY G. Concepts of mathematics—a unique program of high school mathematics for the gifted student. Jan., 26–30.
STEIN, F. MAX. A generalization of triangular numbers. Oct., 414–18.
STEPHANIE, SISTER M. Venn diagrams. Feb., 98–101.
STRETTON, WILLIAM C. The velocity of escape. Oct., 400–02.
STRUIK, D. J. On ancient Chinese mathematics. Oct., 424–32.
———. The origin of L'Hôpital's rule. Apr., 257–60.
SWEET, RAYMOND. Enrichment: a geometry laboratory. Mar., 134–40.
———. High speed computer programming in the junior high school. Nov., 535–37.
TAN, KAIDY. How to find the center of a circle. Nov., 554–56.
TENNEY, ARTHUR E. Another format for proofs in high school geometry. Dec., 606–07.
THEAKER, FRANCES C. Review of *Seeing Through Mathematics, Book 1,* Van Engen, Hartung, Trimble, Berger, and Cleveland; Scott, Foresman, 1962. Dec., 640–41.
———. Review of *Seeing Through Mathematics,*

*Book 2*, Van Engen, Hartung, Trimble, Berger, and Cleveland; Scott, Foresman, 1963. Dec., 641–42.

THORSEN, CAROLYN C. Structure diagrams for geometry proofs. Dec., 608–09.

TINBERG, EILEEN. Review of *Mathematics Projects Handbook*, Hess; Heath, 1962. May, 357.

TOLLEFSON, T. C. Review of *Modern Algebra, Structure and Method, Book I*, Dolciani, Berman, and Freilich; Houghton Mifflin, 1962. May, 359.

TROYER, ROBERT J. An approach to vector geometry. May, 290–97.

TWADDLE, RICHARD D. A look at the base negative ten. Feb., 88–90.

VARBERG, DALE E. The development of modern statistics. Apr., 252–57; May, 344–48.

WAGNER, JOHN. Review of *Mathematics: The Man-Made Universe*, Stein; Freeman, 1963. Dec., 639.

WALLACE, CHARLES E. Review of *Arithmetic*, Book 1, Kinney, Brown, and Blythe; Holt, Rinehart and Winston, 1962. May, 353–54.

———. Review of *Arithmetic*, Book 2, Kinney, Brown, and Blythe; Holt, Rinehart and Winston, 1961. May, 363–54.

WELLS, CHAUNCEY H., JR. Using a negative base for number notation. Feb., 91–93.

WENNINGER, REV. MAGNUS, O.S.B. Stellated rhombic dodecahedron puzzle. Mar., 148–50.

WHITACRE, LILLIAN. Computer programming for high school sophomores. May, 340–43.

WHITE, E. WAYNE. Review of *Investigating Mathematics*, Grossnickle, Brueckner, Merton, and Reckzeh; Holt, Rinehart and Winston, 1962. May, 356–57.

———. Review of *Math Without Numbers*, Bley; Sterling, 1961. May, 357–58.

———. Review of *Moving Into Mathematics*, Grossnickle, Brueckner, Merton, and Reckzeh, Holt, Rinehart and Winston, 1962. May, 356–57.

WILDERMUTH, KARL P. Application of the cosine function. May, 319–20.

WILLIAMS, EMMET D. Comparative study of SMSG and traditional mathematics text material. Nov., 495–504.

WILLIAMS, HORACE E. A study of the effectiveness of classroom teaching techniques following a closed-circuit television presentation in mathematics. Feb., 94–97.

WILLIAMS, WENDELL M. A complete set of elementary rules for testing for divisibility. Oct., 437–42.

WILLOUGHBY, STEPHEN S. Discovery. Jan., 22–25.

WILLS, HERBERT. Review of *Modern Mathematics, Algebra One*, Rosskopf, Morton, Hooten, Sitomer, Willoughby, and Gilbert; Silver Burdett, 1962. Apr., 263–65.

WILSON, HOWARD L. Review of film *Modern Elementary Algebra* (set of five filmstrips), Swain; Society for Visual Education. Mar., 169–70.

———. Review of film *Modern Elementary Algebra—Group II* (set of five filmstrips); Society for Visual Education, 1962. May, 361–62.

WIRSZUP, IZAAK. The school mathematics circle and olympiads at Moscow State University. Apr., 194–210.

WRIGHT, ADRIL LINDSAY. Application of combinations and mathematical induction to a geometry lesson. May, 325–28.

YATES, ROBERT C. Roots of the cubic. Apr., 234–35.

## *Title index*

Aids to understanding proof by mathematical induction. JAMES W. BEACH. Apr., 236–37.

Al-Bīrūnī on determining the meridian. E. S. KENNEDY. Dec., 635–36.

Altitudes, medians, angle bisectors, and perpendicular bisectors of the sides of triangles. HARRY SCHOR. Feb., 105–06.

Another format for proofs in high school geometry. ARTHUR E. TENNEY. Dec., 606–07.

Application of combinations and mathematical induction to a geometry lesson. ADRIL LINDSAY WRIGHT. May, 325–28.

Application of the cosine function. KARL P. WILDERMUTH. May, 319–20.

An approach to vector geometry. ROBERT J. TROYER. May, 290–97.

The area of a rectangle. LAWRENCE A. RINGENBERG. May, 329–32.

Augustus De Morgan and modern mathematics. SISTER MARY CONSTANTIA. Jan., 31–37.

The beginning of work in the theory of probability. CECIL B. READ. Dec., 637–38.

Can present-day students work problems of seven or eight generations ago? CECIL B. READ. Nov., 538–40.

The case against calculus. CARL B. ALLENDOERFER. Nov., 482–85.

The case of the two Sir William Hamiltons. HOWARD EVES. May, 348–49.

Challenging the talented mathematics student. CLAIRE M. NEWMAN. Nov., 525–27.

The closing years of Greek mathematics. JESSE OSBORN. Nov., 540–45.

Committees and representatives (1963–1964). Oct., 455–58.

Comparative study of SMSG and traditional mathematics text material. EMMET D. WILLIAMS and ROBERT V. SHUFF. Nov., 495–504.

A complete set of elementary rules for testing for divisibility. WENDELL M. WILLIAMS. Oct., 437–42.

Computer programming for high school sophomores. LILLIAN WHITACRE. May, 340–43.

Concave polygons. ROSLYN M. BERMAN and MARTIN BERMAN. Oct., 403–06.

Concepts of mathematics—a unique program of high school mathematics for the gifted student. WILMA E. ROLLINS, STANLEY P. BROWN, ARNOLD O. JOHNSON, ANTHONY G.

Soychak, Peter L. Dionne, and Albert B. Bennet, Jr. Jan., 26–30.
Conic sections and their constructions. Sister M. Annunciata Burbach. Oct., 443–46.
Continental Classroom's TV course in probability and statistics. Frederick Mosteller. Oct., 407–13.
The Council's drive to improve school mathematics. Frank B. Allen. Oct., 386–93.
Decimal and duodecimal reciprocals. R. L. Morton. May, 333–39.
The development of modern statistics. Dale E. Varberg. Apr., 252–57; May, 344–48.
A device for demonstrating some elementary properties of integers. Ernst M. Cohn. Feb., 84–87.
Discovery. Stephen S. Willoughby. Jan., 22–25.
Encouraging creativity in the mathematics classroom. L. Edwin Hirschi. Feb., 79–83.
Enrichment: a geometry laboratory. Peter Dunn-Rankin and Raymond Sweet. Mar., 134–40.
Experimental programs. Eugene D. Nichols. *Editor.* Jan., 26–30; Feb., 94–97; Mar., 155–59; Apr., 248–51; May, 340–43; Oct., 419–23; Nov., 535–37; Dec., 627–631.
The first days of geometry. Edward Davis. Dec., 645–46.
Forty-first annual meeting. Feb., 109.
Fractions and line segments. William G. Mehl. Dec., 610–13.
A general test for divisibility. Kenneth A. Seymour. Mar., 151–54.
A generalization of triangular numbers. Janice Miller and F. Max Stein. Oct., 414–18.
The geometric progression presented geometrically. Louis E. DeNoya. Mar., 146–47.
Have you read? Philip Peak. *Editor.* Jan., 7; Feb., 83, 90, 97, 110; Mar., 145, 159; Apr., 260; May, 332; Oct., 448; Nov., 489; Dec., 613, 626, 646.
High speed computer programming in the junior high school. Raymond Sweet. Nov., 535–37.
Historically speaking,—Howard Eves. *Editor.* Jan., 31–37; Feb., 98–104; Mar., 160–64; Apr., 252–60; May, 344–49; Oct., 424–32; Nov., 538–40; Dec., 632–38.
How to find the center of a circle. Kaidy Tan. Nov., 554–56.
An imaginary by any other name. Adrian F. Baylock. Dec., 644–45.
Implementing a new mathematics curriculum. James Henkelman. Apr., 211–17.
The importance of elementary operations. Brother U. Alfred, F.S.C. Dec., 614–19.
An independent classroom experiment using teaching machine materials. George L. Henderson. Apr., 248–51.
Informing the adult citizenry about changing mathematics curriculums. Donald F. Devine. Nov., 528–30.
Interest in the tetrahedron. John J. Keough. Oct., 446–48.
An introduction to the angle measurement theorems in plane geometry. Harry Schor. Feb., 107–08.
Johan de Witt's kinematical constructions of the conics. Joy B. Easton. Dec., 632–35.
Junior high mathematics and the computer. Elliot Pierson. May, 298–301.
Learning and proficiency in mathematics. Robert M. Gagné. Dec., 620–26.
The linear equation and absolute values. Arthur Porges. Apr., 222–23.
A look at the base negative ten. Richard D. Twaddle. Feb., 88–90.
The mathematics laboratory—a meaningful approach to mathematics instruction. Marguerite Kluttz. Mar., 141–45.
The Mathematics League—for motivation and inspiration in mathematics. Paul V. Rogler. Apr., 223, 267, 274.
Mathematics teachers and self-evaluation procedures. Ray H. Simpson. Apr., 238–44.
V. Matric equations. Richard W. Feldmann, Jr. Feb., 101–02.
Membership report. James D. Gates. Nov., 557–58.
Minutes of the Annual Business Meeting. Houston T. Karnes. Oct. 449–52.
Natural bases of logarithms. Meyer Jerison. Apr., 228–33.
NCTM Affiliated Group Officers and Editors. May, 363–71.
NCTM projects and panels. Oct. 458–59.
NCTM representatives. May, 372–73.
A new qualification for mathematics teachers in the United Kingdom. W. A. Dodd. May, 311–13.
The 1963–64 budget. Houston T. Karnes. Oct., 452–55.
A note on curve fitting. Joseph F. Santner. Apr., 218–21.
On ancient Chinese mathematics. D. J. Struik. Oct., 424–32.
On numbers and numerals. Roy Dubisch. Dec., 647.
On the learning of mathematics by children. William M. Fitzgerald. Nov., 517–21.
The origin of L'Hôpital's rule. D. J. Struik. Apr., 257–60.
Pattern multiplication. Robert L. Page. May, 316–18.
The Perry Movement. Gordon D. Mock. Mar., 130–33.
Polar and rectangular coordinate grids on dittomasters. Larew M. Collister. Nov., 553–54.
The problem of the angle bisectors. Joseph Holzinger. May, 321–22.
Proceedings of the Thirteenth Annual Delegate Assembly. Apr., 268–71.
Programmed instructional materials—past, present, and future. Jack E. Forbes. Apr., 224–27.
Registration at NCTM conventions. Nov., 558–60.
A report of an experiment at Camelback High School. Frank H. Anderson, Fred Bedford, Van Clark, and Joan Schipper. Mar., 155–59.
Report to the international congress of mathematicians. John G. Kemeny. Feb., 66–78.
Report of the Nominating Committee. Jan., 43–51.

Reviews and evaluations. KENNETH B. HENDERSON. *Editor.* Jan., 39; Feb., 103–04; Mar., 165–70; Apr., 261–67; May, 350–62; Oct., 433–36; Nov., 546–49; Dec., 639–42.
Reviews of films. A REPORT OF SOME REVIEWING COMMITTEES. Dec., 578–605.
The role of physics in the teaching of mathematics. HOWARD FEHR. Oct., 394–99.
Roots of the cubic. ROBERT C. YATES. Apr., 234–35.
The school mathematics circle and olympiads at Moscow State University. IZAAK WIRSZUP. Apr., 194–210.
A second note on curve fitting. JOSEPH F. SANTNER. May, 307–10.
VI. Similar and congruent matrices; nullity, vacuity, and rank. RICHARD W. FELDMANN, JR. Mar., 163–64.
Some inequality problems. L. H. Lange. 490–94.
Some thoughts about curriculum revision. IRVING ADLER. Nov., 505–10.
Some thoughts on quotient and remainder patterns. ALAN S. MOORE. Nov., 514–16.
Stellated rhombic dodecahedron puzzle. REV. MAGNUS WENNINGER, O.S.B. Mar., 148–50.
Strategies of proof. EDITH ROBINSON. Nov., 531–34.
Structure diagrams for geometry proofs. CAROLYN C. THORSEN. Dec., 608–09.
A study of the effectiveness of classroom teaching technique following a closed-circuit television presentation in mathematics. HORACE E. WILLIAMS. Feb., 94–97.
Survey of Ohio college opinions with reference to high school mathematics programs. ROBERT S. BROWN. Apr., 245–47.
Teaching fundamental concepts of mathematics at the college level by closed circuit television. F. DOYLE ALEXANDER. Dec., 627–31.
Teaching inductive proofs indirectly. WARREN E. SHREVE. Dec., 643–44.
Techniques of solving rational equations. FRANK T. KOCHER and RALPH T. HEIMER. Nov., 486–89.
Tips for beginners. JOSEPH N. PAYNE and WILLIAM C. LOWRY. *Editors.* Jan., 40–42; Feb., 105–08; Mar., 171–174; Oct., 437–48; Nov., 550–56; Dec., 643–46.
Toward autotelic learning of mathematical logic. LAYMAN E. ALLEN. Jan., 8–21.
IV. The "transposed" or "conjugate" matrix; orthogonal matrices. RICHARD W. FELDMANN, JR. Jan., 37–38.
A triangle construction. N. C. SCHOLOMITI and R. G. HILL. May, 323–24.
Trisection of an angle by optical means. A. E. HOCHSTEIN. Nov., 522–24.
Twenty-third Summer Meeting. Apr., 271–72; May, 349.
A two-year study of eighth-grade Algebra I. WILLIAM J. HEGSTROM and DONALD E. RIFFLE. Oct., 419–23.
Unilateral mathematics teaching. LADIS D. KOVACH. Nov., 550–52.
Using a negative base for number notation. CHAUNCEY H. WELLS, JR. Feb., 91–93.
Using the library in junior high school mathematics classes. ROLAND L. SCHMIDT. Jan., 40–42.
Using vectors to solve simultaneous equations. LEONARD M. SALZARULO. May, 314–15.
A variation on binary notation. J. MAURICE KINGSTON. Nov., 511–13.
The velocity of escape. WILLIAM C. STRETTON. Oct., 400–02.
Venn diagrams. SISTER M. STEPHANIE. Feb., 98–101.
Vigenère's "Traicté des Chiffres." MARTHA C. CONDIT. Mar., 160–63.
What do they really say? WILLIAM G. MEHL. Mar., 171–74.
What every teacher should know about the uses of mathematics. CLIFFORD BELL. May, 302–06.
What's new? Jan., 25; Feb., 87; Mar., 154; Apr., 233; May, 315; Oct., 393; Nov., 537; Dec., 619.
Why arithmetic works. HOWARD LEVI. Jan., 2–7.
Your professional dates. Jan., 52; Feb., 108; Mar., 175–76; Apr., 273–74; May, 374; Oct., 459–60; Nov., 560; Dec., 648.

## *Subject index*

ABILITY GROUPING
On the learning of mathematics by children, 517–21.
A report of an experiment at Camelback High School, 155–59.
A two-year study of eighth-grade Algebra I, 419–23.
ALGEBRA
Curriculum
A two-year study of eighth-grade Algebra I, 419–23.
Miscellaneous
The importance of elementary operations, 614–19.
Teaching methods
Unilateral mathematics teaching, 550–52.
Topics in
The linear equation and absolute values, 222–23.
V. Matric equations, 101–02.
Natural bases of logarithms, 228–33.
Roots of the cubic, 234–35.
VI. Similar and congruent matrices; nullity, vacuity, and rank, 163–64.
Some inequality problems, 490–94.
Techniques of solving rational equations, 486–89.
IV. The "transposed" or "conjugate" matrix; orthogonal matrices, 37–38.
Using vectors to solve simultaneous equations, 314–15.
APPLICATIONS
Miscellaneous
What every teacher should know about the uses of mathematics, 302–06.
Science and Engineering
The role of physics in the teaching of mathematics, 394–99.

The velocity of escape, 400–02.
ARITHMETIC
Miscellaneous
Fractions and line segments, 610–13.
The importance of elementary operations, 614–19.
Why arithmetic works, 2–7.
Teaching Methods
Unilateral mathematics teaching, 550–52.
Topics in
A complete set of elementary rules for testing for divisibility, 437–42.
Pattern multiplication, 316–18.
Some thoughts on quotient and remainder patterns, 514–16.
ASTRONOMY
Al-Bīrūnī on determining the meridian, 635–37.
CALCULATORS AND COMPUTERS
Computer programming for high school sophomores, 340–43.
High speed computer programming in the junior high school, 535–37.
Junior high mathematics and the computer, 298–301.
CALCULUS
Curriculum
The case against calculus, 482–85.
Miscellaneous
The origin of L'Hôpital's rule, 257–60.
Topics in
Natural bases of logarithms, 228–33.
CLUBS, MATHEMATICS
The Mathematics League—for motivation and inspiration in mathematics, 223, 267, 274.
CURRICULUM
High School
The case against calculus, 482–85.
Comparative study of SMSG and traditional mathematics text material, 495–504.
Survey of Ohio college opinions with reference to high school mathematics programs, 245–47.
Junior High School
High speed computer programming in the junior high school, 535–37.
A two-year study of eighth-grade Algebra I, 419–23.
Miscellaneous
Implementing a new mathematics curriculum, 211–17.
Informing the adult citizenry about changing mathematics curriculums, 528–30.
On the learning of mathematics by children, 517–21.
The Perry Movement, 130–33.
Some thoughts about curriculum revision, 505–10.
DEVICES
Computer programming for high school sophomores, 340–43.
Junior high mathematics and the computer, 298–301.
Polar and rectangular coordinate grids on ditto-masters, 553–54.
*see also* VISUAL AIDS
GENERAL MATHEMATICS
Topics in
Can present-day students work problems of seven or eight generations ago? 538–40.
GEOMETRY
Miscellaneous
Altitudes, medians, angle bisectors, and perpendicular bisectors of the sides of triangles, 105–06.
Another format for proofs in high school geometry, 606–07.
An approach to vector geometry, 290–97.
How to find the center of a circle, 554–56.
An introduction to the angle measurement theorems in plane geometry, 107–08.
A note on curve fitting, 218–21.
A second note on curve fitting, 307–10.
Some inequality problems, 490–94.
Stellated rhombic dodecahedron puzzle, 148–50.
Structure diagrams for geometry proofs, 608–09.
Teaching Methods
Enrichment: a geometry laboratory, 134–40.
The first days of geometry, 645–46.
The geometric progression presented geometrically, 146–47.
Topics in
Application of combinations and mathematical induction to a geometry lesson, 325–28.
Concave polygons, 403–06.
Conic sections and their constructions, 443–46.
Interest in the tetrahedron, 446–48.
Johan de Witt's kinematical constructions of the conics, 632–35.
The problem of the angle bisectors, 321–22.
A triangle construction, 323–24.
Trisection of an angle by optical means, 522–24.
GRAPHS AND GRAPHING
A note on curve fitting, 218–21.
Polar and rectangular coordinate grids on ditto-masters, 553–54.
A second note on curve fitting, 307–10.
HISTORY OF MATHEMATICS
Augustus De Morgan and modern mathematics, 31–37.
The case of the two Sir William Hamiltons, 348–49.
The development of modern statistics, 252–57, 344–48.
Historically speaking, 31–38, 98–104, 160–64, 252–60, 344–49, 424–32, 538–45, 632–38.
V. Matric equations, 101–02.
The origin of L'Hôpital's rule, 257–60.
The Perry Movement, 130–33.
VI. Similar and congruent matrices; nullity, vacuity, and rank, 163–64.
IV. The "transposed" or "conjugate" matrix; orthogonal matrices, 37–38.
Venn diagrams, 98–101.
Vigenère's "Traicté des Chiffres," 160–63.
Famous Mathematicians

The beginning of work in the theory of probability, 637–38.
The closing years of Greek mathematics, 540–45.
Miscellaneous
Al-Bīrūnī on determining the meridian, 635–37.
Johan de Witt's kinematical constructions of the conics, 632–35.
On ancient Chinese mathematics, 424–32.
INDUCTION, MATHEMATICAL
Aids to understanding proof by mathematical induction, 236–37.
Application of combinations and mathematical induction to a geometry lesson, 325–28.
Teaching inductive proofs indirectly, 643–44.
LANGUAGE OF MATHEMATICS
An imaginary by any other name, 644–45.
On numbers and numerals, 647.
What do they really say? 171–74.
LITERATURE
Review of *A Program in Contemporary Algebra, Book 1, Sets, Numbers, and the Language of Algebra*, Heimer, Kocher, and Lottes, 548–49.
Review of *A Program in Contemporary Algebra, Book 2, Equations and Inequalities in One Variable*, Heimer, Kocher, and Lottes, 549.
Review of *Algebra and Trigonometry*, Miller and Green, 350–51.
Review of *Algebra and Trigonometry*, Rees and Sparks, 433.
Review of *Algebra One, A Modern Course*, Vannatta, Goodwin, with Fawcett, 351–52.
Review of *Algebra II*, Brumfiel, Eicholz, and Shanks, 352–53.
Review of *Algebra Two, A Modern Course*, Vannatta, Goodwin, with Fawcett, 351–52.
Review of *Arithmetic*, Book 1, Kinney, Brown, and Blythe, 353–54.
Review of *Arithmetic*, Book 2, Kinney, Brown, and Blythe, 353–54.
Review of *Arithmetic: Concepts and Skills*, Brumfiel, Eicholz, Shanks, and O'Daffer, 433–34.
Review of *Basic College Algebra*, Mancill and Gonzalez, 434–35.
Review of *Contemporary Algebra and Trigonometry*, Griswold, Keedy, and Schacht, 354.
Review of *Discovering Structure in Algebra*, Grossnickle, Reckzeh, and Bernhardt, 165–66.
Review of *Elements of Algebra*, Banks and Wren, 354–55.
Review of *Exploring Modern Mathematics*, Book 1, Keedy, Jameson, and Johnson, 546–47.
Review of film, *Modern Elementary Algebra* (set of five filmstrips), Swain, 169–70.
Review of film *Modern Elementary Algebra—Group II* (five filmstrips), 361–62.
Review of *First Course in Algebra*, Mallory, Skeen, and Meserve, 166–67.
Review of *Foundations of Mathematics*, Wiebe, 261.
Review of *Fundamental Concepts of Elementary Mathematics*, Brumfiel, Eicholz, and Shanks, 39.
Review of *Geometry, A Unified Course*, Goodwin, Vannatta, with Fawcett, 355–56.
Review of *High School Mathematics, Unit 8, Sequences*, University of Illinois Committee on School Mathematics, 103.
Review of *Introduction to Mathematics*, Brumfiel, Eicholz, and Shanks, 103–04.
Review of *Investigating Mathematics*, Grossnickle, Brueckner, Merton, and Reckzeh, 356–57.
Review of *Math Without Numbers*, Bley, 357–58.
Review of *Mathematical Discovery, On Understanding Learning, and Teaching Problem Solving*, Volume I, Polya, 167.
Review of *Mathematics, a Cultural Approach*, Kline, 261–62.
Review of *Mathematics Enrichment Book E, Slide Rule, Clinometer, Probability, Sets*, Mueller and Hach, 547.
Review of *Mathematics Enrichment—Program A*, Spooner, 262–63.
Review of *Mathematics for Secondary School Teachers*, Meserve and Sobel, 263.
Review of *Mathematics: The Man-Made Universe*, Stein, 639.
Review of *Mathematics Projects Handbook*, Hess, 357.
Review of *Modern Algebra, First Course*, Johnson, Lendsey, and Slesnick, 358–59.
Review of *Modern Algebra, Structure and Method, Book I*, Dolciani, Berman, and Freilich, 359.
Review of *Modern College Algebra*, Vance, 167–68.
Review of *Modern Geometry—Its Structure and Function*, Henderson, Pingry, and Robinson, 359–61.
Review of *Modern Geometry: Structure and Method*, Jurgensen, Donnelly, and Dolciani, 639–40.
Review of *Modern Mathematics, Algebra One*, Rosskopf, Morton, Hooten, Sitomer, Willoughby, and Gilbert, 263–65.
Review of *Modern Mathematics, A Programmed Textbook*, Eigen, Kaplan, Emerson, and Krouse, 361.
Review of *Modern Mathematics for Junior High School, Book 1*, Rosskopf, Morton, Hooten, and Sitomer, 265–66.
Review of *Modern Mathematics for Junior High School, Book 2*, Rosskopf, Morton, Hooten, and Sitomer, 265–66.
Review of *Modern Mathematics in the Elementary and Junior High Schools*, Williams, Read, and Williams, 168–69.
Review of *Modular Arithmetic*, Ginn Arithmetic Enrichment Program, Marks, Smart, and Purdy, 266–67.
Review of *Moving Into Mathematics*, Gross-

nickle, Brueckner, Merton, and Reckzeh, 356–57.
Review of *New First Algebra*, Hart, Schult, and Bristol, 169.
Review of *New Second Algebra*, Hart, Schult, and Bristol, 435–36.
Review of *New Ways in Numbers—7*, An Arithmetic Series for Catholic Schools, Sister Mary Canisius, 547–48.
Review of *Second Course in Algebra*, Mallory, Skeen, and Meserve, 166–67.
Review of *Seeing Through Mathematics, Book 1*, Van Engen, Hartung, Trimble, Berger, and Cleveland, 640–41.
Review of *Seeing Through Mathematics, Book 2*, Van Engen, Hartung, Trimble, Berger, and Cleveland, 641–42.
Review of *Systematic Slide Rule Guide*, Allan, 642.
Review of *Tomorrow's Math, Unsolved Problems for the Amateur*, Ogilvy, 267.
Review of *Worktext in modern mathematics*, Harston, 436.
Reviews and evaluations, 39, 103–04, 165–70, 261–67, 350–62, 433–36, 546–49, 639–42.
Miscellaneous
The closing years of Greek mathematics, 540–45.
Have you read? 7, 83, 90, 97, 110, 145, 159, 260, 332, 448, 460, 489, 494, 510, 613, 626, 646.
What's new? 25, 87, 154, 233, 315, 393, 402, 537, 552, 619.
Reviews and evaluations
Reviews of films, 578–605.

LOGIC
Strategies of proof, 531–34.
Toward autotelic learning of mathematical logic, 8–21.

MATHEMATICS, GENERAL
Education
Learning and proficiency in mathematics, 620–26.
On the learning of mathematics by children, 517–21.
Some thoughts about curriculum revision, 505–10.

MATHEMATICS IN OTHER COUNTRIES
A new qualification for mathematics teachers in the United Kingdom, 311–13.
Report to the international congress of mathematicians, 66–78.
The school mathematics circle and olympiads at Moscow State University, 194–210.

MEASUREMENT
The area of a rectangle, 329–32.

NCTM
Committee Reports
The 1963–64 budget, 452–55.
Report of the Nominating Committee, 43–51.
Meetings
Forty-first annual meeting, 109.
Twenty-third Summer Meeting, 271–72, 349.
Minutes
Minutes of the Annual Business Meeting, 449–52.
Proceedings of the Thirteenth Annual Delegate Assembly, 268–71.
Miscellaneous
The Council's drive to improve school mathematics, 386–93.
Membership report, 557–58.
NCTM projects and panels, 458–59.
Registration at NCTM conventions, 558–60.
Your professional dates, 52, 108, 175–76, 273–74, 374, 459–60, 560, 648.
Officers
Committees and representatives (1963–1964), 455–58.
NCTM Affiliated Group Officers and Editors, 363–71.
NCTM representatives, 372–73.

NOTATION AND TERMINOLOGY
A variation on binary notation, 511–13.
*see also* LANGUAGE OF MATHEMATICS

NUMBERS AND NUMBER SYSTEMS, THEORY
Decimal and duodecimal reciprocals, 333–39.
A device for demonstrating some elementary properties of integers, 84–87.
Fractions and line segments, 610–13.
A general test for divisibility, 151–54.
A generalization of triangular numbers, 414–18.
A look at the base negative ten, 88–90.
On ancient Chinese mathematics, 424–32.
Some thoughts on quotient and remainder patterns, 514–16.
Using a negative base for number notation, 91–93.

OPINIONS AND PHILOSOPHIES
The case against calculus, 482–85.
Some thoughts about curriculum revision, 505–10.
Points and Viewpoints
On numbers and numerals, 647.
Points and viewpoints, 647.

PROBABILITY
The beginning of work in the theory of probability, 637–38.

PROBLEM SOLVING
Can present-day students work problems of seven or eight generations ago? 538–40.
Some inequality problems, 490–94.

RECREATIONAL MATHEMATICS
Conic sections and their constructions, 443–46.
A generalization of triangular numbers, 414–18.
Interest in the tetrahedron, 446–48.
The Mathematics League—for motivation and inspiration in mathematics, 223, 267, 274.
Pattern multiplication, 316–18.
Stellated rhombic dodecahedron puzzle, 148–50.
Toward autotelic learning of mathematical logic, 8–21.

Trisection of an angle by optical means, 522–24.
Vigenère's "Traicté des Chiffres," 160–63.
RESEARCH
A report of an experiment at Camelback High School, 155–59.
Education
Comparative study of SMSG and traditional mathematics text material, 495–504.
Computer programming for high school sophomores, 340–43.
Concepts of mathematics—a unique program of high school mathematics for the gifted student, 26–30.
An independent classroom experiment using teaching machine materials, 248–51.
Learning and proficiency in mathematics, 620–26.
On the learning of mathematics by children, 517–21.
A study of the effectiveness of classroom teaching techniques following a closed-circuit television presentation in mathematics, 94–97.
Survey of Ohio college opinions with reference to high school mathematics programs, 245–47.
Teaching fundamental concepts of mathematics at the college level by closed-circuit television, 627–31.
Miscellaneous
Experimental programs, 26–30, 94–97, 155–59, 248–51, 340–43, 419–23, 535–37, 627–31.
STATISTICS
Continental Classroom's TV course in probability and statistics, 407–13.
The development of modern statistics, 252–57, 344–48.
SYMBOLISM
On ancient Chinese mathematics, 424–32.
TEACHER
Education
A new qualification for mathematics teachers in the United Kingdom, 311–13.
Evaluation of
Mathematics teachers and self-evaluation procedures, 238–44.
TEACHING METHODS
Discovery
Discovery, 22–25.
Miscellaneous
Altitudes, medians, angle bisectors, and perpendicular bisectors of the sides of triangles, 105–06.
Challenging the talented mathematics student, 525–27.
Concepts of mathematics—a unique program of high school mathematics for the gifted student, 26–30.
Enrichment: a geometry laboratory, 134–40.
The first days of geometry, 645–46.
An imaginary by any other name, 644–45.
The importance of elementary operations, 614–19.
An introduction to the angle measurement theorems in plane geometry, 107–08.
The mathematics laboratory—a meaningful approach to mathematics instruction, 141–45.
The Perry Movement, 130–33.
Teaching fundamental concepts of mathematics at the college level by closed-circuit television, 627–31.
Teaching inductive proofs indirectly, 643–44.
Tips for beginners, 40–42, 105–08, 171–74, 437–48, 550–56, 643–46.
Unilateral mathematics teaching, 550–52.
Using the library in junior high school mathematics classes, 40–42.
What do they really say? 171–74.
Programmed Instruction
Encouraging creativity in the mathematics classroom, 79–83.
An independent classroom experiment using teaching machine materials, 248–51.
Programmed instructional materials—past, present, and future, 224–27.
Report of the international congress of mathematicians, 66–78.
A study of the effectiveness of classroom teaching techniques following a closed-circuit television presentation in mathematics, 94–97.
TELEVISION
Concepts of mathematics—a unique program of high school mathematics for the gifted student, 26–30.
Continental Classroom's TV course in probability and statistics, 407–13.
A study of the effectiveness of classroom teaching techniques following a closed-circuit television presentation in mathematics, 94–97.
Teaching fundamental concepts of mathematics at the college level by closed-circuit television, 627–31.
TESTS
The school mathematics circle and olympiads at Moscow State University, 194–210.
TEXTBOOKS
Comparative study of SMSG and traditional mathematics text material, 495–504.
TRIGONOMETRY
Application of the cosine function, 319–20.
The problem of the angle bisectors, 321–22.
VISUAL AIDS
A device for demonstrating some elementary properties of integers, 84–87.
Enrichment: a geometry laboratory, 134–40.
The mathematics laboratory—a meaningful approach to mathematics instruction, 141–45.
Reviews of films, 578–605.
Toward autotelic learning of mathematical logic, 8–21.